In the Claims

Claims 1-16 (Cancelled)

Claim 17 (Currently amended): A method of targeting a stem cell to a target tissue in a human or non-human animal subject wherein the target tissue is damaged or at increased risk of damage, the method comprising administering to the target tissue a composition comprising:

(a) a first polynucleotide comprising:

(1) a gene switch/biosensor comprising a nucleic acid sequence encoding a physiological stimulus-sensitive chimeric transactivator, and

(2) an operatively linked tissue-specific promoter; and

(b) a second polynucleotide comprising a nucleic acid sequence encoding a stem cell-attracting chemokine;

wherein said target tissue is cardiac tissue, and wherein said target tissue damage is reduced or repaired or said risk of damage of said target tissue is reduced.

Claim 18 (Previously presented): The method of claim 17, wherein the composition is administered to host cells by a delivery method selected from the group consisting of microinjection, electroporation, calcium phosphate transfection, DEAE dextran transfection, polylysine conjugates, receptor-mediated uptake system, liposomal delivery, lipid-mediated delivery system, matrix-impregnated delivery system, microparticle encapsulation, intra-cellular targeting ligand, virion-like particles, and viral vectors.

Claim 19 (Cancelled)

Claim 20 (Previously presented): The method of claim 17, wherein said administering comprises administering the composition to host cells *in vitro* and subsequently administering the host cells to a subject.

Claim 21 (Previously presented): The method of claim 17, wherein said administering comprises administering the composition to cells of the target tissue *in vivo*.

Claim 22 (Previously presented): The method of claim 17, wherein following said administering, the nucleic acid sequence encoding the stem cell-attracting chemokine is expressed in the target tissue, and wherein the chemokine attracts endogenous stem cells or endogenous progenitor cells to the target tissue.

Claim 23 (Previously presented): The method of claim 17, wherein said method further comprises co-administering stem cells to the target tissue.

Claim 24 (Previously presented): The method of claim 17, wherein said method further comprises administering an agent that causes stem cells to migrate to the target tissue.

Claims 25-28 (Cancelled)

Claim 29 (Previously presented): The method of claim 17, wherein said physiological stimulus-sensitive chimeric transactivator is oxygen-sensitive and comprises a GAL4 DNA-binding domain (DBD), a oxygen-dependent degradation domain (ODD), and a p65 activation domain (p65 AD); and wherein said second polynucleotide further comprises a GAL4 upstream activating sequence (UAS) linked to said nucleic acid sequence of said second polynucleotide, and wherein in response to hypoxia, said transactivator binds to the GAL4 UAS, resulting in expression of said nucleic acid sequence encoding said stem cell-attracting chemokine.

Claims 30-31 (Cancelled)

Claim 32 (Previously presented): The method of claim 17, wherein said tissue-specific promoter is a cardiac-specific promoter.

Claim 33 (Previously presented): The method of claim 17, wherein said tissue-specific promoter is a cardiac-specific promoter selected from the group consisting of the ventricular form of the MLC-2v promoter, a fragment of the native MLC-2v promoter, alpha myosin heavy chain promoter, and myosin light chain-2 promoter.

Claim 34 (Currently amended): The method of claim 17, wherein said stem cell-attracting chemokine is selected from the group consisting of ~~SCF~~ stem cell factor (SCF), vascular endothelial growth factor (VEGF), granulocyte colony-stimulating factor (G-CSF), an integrin, and ~~hSDF-1alpha~~ human stromal-derived factor-1alpha (hSDF-1alpha).

Claim 35 (Previously presented): The method of claim 17, wherein said stem cell-attracting chemokine comprises hSDF-1alpha.

Claim 36 (Previously presented): The method of claim 17, wherein said physiological stimulus is associated with cell injury.

Claim 37 (Previously presented): The method of claim 17, wherein said physiological stimulus-sensitive chimeric transactivator is sensitive to hypoxia or an elevated glucose level.

Claim 38 (Previously presented): The method of claim 17, wherein the stem cell attracted by said stem cell-attracting chemokine is from an anatomical site selected from the group consisting of bone marrow, peripheral blood, brain, spinal cord, dental pulp, blood vessels, skeletal muscle, epithelia of the skin, epithelia of the digestive system, cornea, retina, liver, and pancreas.

Claim 39 (Previously presented): The method of claim 17, wherein said composition is a recombinant viral vector.

Claim 40 (Previously presented): The method of claim 17, wherein said composition is a recombinant viral vector selected from the group consisting of an adenovirus, an adeno-associated virus, a herpes simplex virus, a lentivirus, and a retrovirus.

Claim 41 (Previously presented): The method of claim 17, wherein said composition is a recombinant adeno-associated viral vector.

Claim 42 (Previously presented): The method of claim 17, wherein said composition is a non-viral vector.

Claim 43 (Previously presented): The method of claim 17, wherein said composition is a plasmid.

Claim 44 (Currently amended): The method of claim 17, wherein said method further comprises co-administering to the target tissue: 1) stem cells and 2) an agent that causes stem cells to migrate to the target tissue.

Claim 45 (Previously presented): The method of claim 29, wherein said second polynucleotide further comprises a TATA element.

Claim 46 (Previously presented): The method of claim 29, wherein said second polynucleotide comprises at least two copies of said GAL4 upstream activating sequence (UAS).

Claim 47 (New): The method of claim 17, wherein said stem cell is an endogenous cardiac or blood vessel stem cell.